

14 ATTACHMENT 7 - ECONOMIC ANALYSIS – WATER SUPPLY COSTS AND BENEFITS

14.1 Plum Basin Project

14.1.1 Project Costs

As described in the budget of Attachment 4, the estimated initial cost for this project is \$3,258,559. This includes all costs from project design to construction. It is expected that the Basin will have a life of 50 years. The concrete structures are expected to last this life span; however, SCADA equipment is expected to be replaced on a 10 year cycle. This is based on a combination of Tulare ID experience, manufacturer's information, and life expectancies listed in Design and Operation of Farm Irrigation Systems, ASAE Monograph No. 3, 1981 (pg 58).

There are costs related to maintaining and operating the facility. A typical recharge period is 120 days on an average annual basis. During this time the District Engineer expects to spend an hour per day (roughly \$8,500 at \$70.72/hr) on administrative issues, such as, coordinating water deliveries and record keeping per the agreement with the City of Tulare. Operations is expected to expend one half (0.5) hour per day (approximately \$1,500 at \$23.05/hr), which includes the ditchtenders travel to site, observations, and adjustments. Maintenance, such as levee and SCADA upkeep and basin disking, is estimated at \$11,000 per year. Monitoring of the site activities and groundwater levels is estimated to cost an additional \$500 per year.

14.1.2 Quantitative Project Benefits

The Plum Basin Project capitalizes on the conjunctive-use nature of the District to maximize the delivery of available surplus surface water supplies and thereby maintain groundwater supplies for later extraction. This conservation will increase the amount of available supply and transform surface water that previously couldn't be stored into banked groundwater. The conservation from this Project will supply additional surface water supplies and will allow growers to avoid using groundwater resources from a basin historically in overdraft. Allowing growers to regularly save these resources will reduce over using the limited and rapidly declining groundwater supplies in the area that are currently strained from back to back years of regional drought.

Groundwater resources in Tulare ID and the surrounding area will be preserved through the following: 1) additional surface water will, be delivered through the Project thus offsetting groundwater pumping and 2) the money generated from Tulare ID's delivery

KAWEAH RIVER BASIN IRWM GROUP 2011 IMPLEMENTATION GRANT PROPOSAL

Kaweah Delta WCD

of water to the City of Tulare will allow the District to acquire other surplus supplies to increase deliveries to growers within the District. The District anticipates acquiring approximately 3,720 AF/year of excess surface water for groundwater recharge on behalf of the City of Tulare. This should generate roughly \$20/AF. With the money generated, Tulare ID will be able to purchase an additional 5,580 in surplus surface water supply on an average annual basis. The additional surface water supply will relieve groundwater pumping. The cost of pumping ground water in Tulare ID is in the order of \$30/AF (assuming a depth of 150' at \$0.10/KWh). The growers within Tulare ID will realize a savings of \$167,000/yr.

The reduction in Tulare ID's operational spills will, over time, produce more water for Tulare ID to use and the limited water resources will be more effective. Estimated spill is 500 AF/yr. The revenue to be generated is roughly \$15/AF, and thereby a saving of \$7,500/yr.

Also, the City of Tulare's domestic water supply will be made more reliable through the additional banking afforded by this Project. The Project will increase the water made available by the Tulare ID to benefit the City of Tulare through an existing groundwater recharge arrangement. For the City of Tulare, this Project primarily addresses regional water supply shortages through the reduction of groundwater overdraft and the preservation of the attendant extraction capabilities of City of Tulare wells. Maintaining groundwater levels will avoid the cost of lowering the pump bowls of the City's 28 wells, estimated at \$8,500/well.

14.1.3 Qualitative Project Benefits

Surface Water Storage. It has been postulated that future climate variability may bring about more rain flood periods and less storable snow melt for the San Joaquin Valley's watersheds. Larger rain events will require more groundwater banking capacity to capture such water that previously remained in foothill reservoirs (Lakes Millerton and Kaweah). This Project adds recharge/regulation basin capacity for the District and City and should thus aid in mitigating for adverse impacts due to climate variability.

San Joaquin River Restoration. The additional surface water supplies made available to Tulare ID would also partially address water supply shortages due to San Joaquin River Restoration impacts and heightened competition for finite water supplies within the San Joaquin Valley given urban growth. This will help to address water supply reductions from the San Joaquin River Restoration settlement, and curtailment of Delta pumping due to Delta Smelt issues. Also, this reduction in demand will aid all CVP water users south of the Delta by decreasing competition for surface water through the

satisfaction of the City's need during times from available flood and surplus water from the Kaweah and St. Johns River.

Beneficial use of Floodwater. This Project will construct a new basin that will allow the District to deliver surplus and floodwater from the Kaweah and St. Johns Rivers and the Friant Division CVP for a beneficial use and thereby reduce the hazardous floodwater that eventually reaches the Tulare Lake Bottom which is currently farmed.

Preservation of Groundwater Resources. Groundwater resources in the District and the surrounding area will be preserved through the following: 1) additional surface water will, be delivered through the Project thus offsetting groundwater pumping (Figure 1); and 2) the money generated from Tulare ID's delivery of water to the City will allow the District to acquire other surplus supplies to increase deliveries to growers within the District.

14.2 Water Reuse Pipeline Project

14.2.1 Project Costs

As described in the budget of Attachment 4, the estimated initial cost for this project is \$14,216,594. This includes all costs from project design to construction. It is expected that the project will have a life of 40 years. The concrete structures are expected to last this life span; however, SCADA equipment is expected to be replaced on a 10 year cycle, along with components of the pumping equipment. This is based on a combination of City experience and manufacturer's information.

There are costs related to maintaining and operating the facility. A facility of this nature will be operated year round. Initial estimates show that administration and maintenance of the facility will cost \$75,000/year. This assumes approximately one employee with two man-hours per day at a rate of \$100 (employee's cost to the City), plus miscellaneous equipment. Tasks of this employee would include, coordinating deliveries, creating reports, inspecting and maintaining facility, and SCADA system upkeep. It is assumed one-third time would be spent on administrative tasks (\$25,000/yr) and two-thirds time spent on maintenance (\$50,000/yr).

The only major operation cost associated with the project is the pump motor energy use. This is based on the flow and head conditions, and assumed operating efficiencies and power costs. The project will not reach full capacity until 2031, so it is assumed flow will increase linearly over this time. This change in flow rate causes operating

costs to escalate from \$20,905 to \$36,495 at 2031. The cost will hold at 2031 since this is full capacity.

14.2.2 Quantitative Project Benefits

This Pipeline project will be utilized to conserve water, create access to a more reliable supply of surface water for Tulare Irrigation District, improve groundwater recharge capabilities for the City and the District, and foster a water exchange program between two regional partners.

It is estimated that this project will provide 29,000 AF/yr of surface water supply. This is water that would have normally been pumped from the groundwater aquifer. It cost roughly \$30/AF to pump groundwater (assuming a depth of 150' at \$0.10/KWh), so this project can expect to save \$870,000/yr in energy costs. Another benefit of this project is a new reliable water supply to Tulare ID. The District will be able to sell this water to their growers at their rate of \$33/AF. Tulare ID's portion of water supply is 13,000 AF. This will yield the District \$429,000/yr.

Current negotiations have indicated that the agreement between Tulare ID and City of Visalia will consist of a 2 to 1 exchange ratio. Where the District will return one half of the water they receive to the City, from wet year supplies. Wet years normally occur once every three years. Previously during this time, mechanisms were not in place that would allow this delivery to the City to happen. As a result, this water would have continued downstream and not benefitted the local groundwater table. Essentially, with the delivery to the City, this project will import an additional 6,500 AF/yr, which the City will recharge to mitigate for groundwater overdraft. With this project the City will avoid the cost of \$35/AF to purchase surplus wet year water, equating to \$682,500 every 3 years (6,500 AF/year x 3 years x \$35/AF).

Another benefit of this project is the avoided National Pollutant Discharge Elimination System (NPDES) permit that the City will not have to pay. If the City continued their current practice of discharging watering into Mill Creek, they would be forced to expend roughly \$100,000/year in permit fees and administration. With the construction of the project pipelines, the water will no longer be discharged into Waters of the United States, but rather diverted for reuse.

14.2.3 Qualitative Project Benefits

San Joaquin River Restoration. These supplies would partially replace water supply shortages due to San Joaquin River Restoration impacts and heightened competition

for finite water supplies within the San Joaquin valley given urban growth. This will aid all CVP water users south of the Delta by decreasing competition for surface water through the satisfaction of the City's need during times from available flood and surplus water from the Kaweah and St. Johns River. Specifically, this will help to address water supply reductions from the San Joaquin River Restoration settlement, and curtailment of Delta pumping due to Delta Smelt issues.

Groundwater Levels. Aquifer groundwater levels will improve as a result of the exchange agreement between the City of Visalia and Tulare Irrigation District. The current wastewater treatment plant recharge does not benefit the city as it is not located near any city wells. As part of the agreement, Tulare ID will take tertiary treated water from the plant, and in exchange will recharge groundwater up-gradient of the city. This will aid to stabilize water levels and in turn reduce energy usage over time.

14.3 Paregien Basin Project

14.3.1 Project Costs

As described in the budget of Attachment 4, the estimated initial cost for this project is \$1,698,040. This includes all costs from project design to construction. It is expected that the Basin will have a life of 50 years. The concrete structures are expected to last this life span. This is based on a combination of District experience, manufacturer's information, and life expectancies listed in Design and Operation of Farm Irrigation Systems, ASAE Monograph No. 3, 1981 (pg 58).

There are costs related to maintaining and operating the facility. Of the period analyzed, it is possible that the basin could have water in it year round. . During this time the District Engineer expects to spend an hour per week (roughly \$3,185 at \$61.25/hr) on administrative issues, such as, coordinating water deliveries and record keeping. Operations is expected to expend one half (0.5) hour per day (approximately \$4,300 at \$23.05/hr), which includes the ditchtenders travel to site, observations, and adjustments. Maintenance, such as basin disking, is estimated at \$10,000 per year. Monitoring of the site activities and groundwater levels is estimated to cost an additional \$500 per year.

14.3.2 Quantitative Project Benefits

The primary water supply benefit will be attained through groundwater recharge in the new basin that will increase the reliability of groundwater resources in the area and will mitigate the overdraft of the City of Farmersville. The secondary floodwater damage reduction benefit will be attained through the protection of the City of Farmersville from

Deep Creek floodwater that will be regulated through the proposed facility, as described in Attachment 9. Deep Creek flow rate values were obtained over the hydrologically balanced period of 1997 - 2006. The monthly acre-foot values were averaged to develop an average annual monthly supply expected in the creek. These numbers were then compared to the recharge area, basin volume, and a typical recharge rate for the area of 0.3 ft/day. It was found that over a year period the facility has the capability of recharge approximately 2,370 AF/year. In most situations, the limiting factor is the projects area, meaning that benefits can most likely be expected in dryer years if the water is available. This water has been valued at \$30/AF since this water comes from the Kaweah River system it has little cost, but it is compared to purchasing this water on the through the CVP, where water could conservatively cost \$30/AF, This provides a benefit of approximately \$71,100/yr.

14.3.3 Qualitative Project Benefits

San Joaquin River Restoration. These supplies would also partially address water supply shortages due to San Joaquin River Restoration impacts and heightened competition for finite water supplies within the San Joaquin valley given urban growth. Specifically, this will help to address water supply reductions from the San Joaquin River Restoration settlement, and curtailment of Delta pumping due to Delta Smelt issues.

Groundwater Levels. Aquifer groundwater levels will improve as a result the recharge efforts of Kaweah Delta Water Conservation District. Recharging this water up-gradient of many users within the Kaweah Delta WCD boundary will aid to stabilize water levels and in turn equalize energy usage over time.

Surface Water Storage. It has been postulated that future climate variability may bring about more rain flood periods and less storable snow melt for the San Joaquin Valley's watersheds. Larger rain events will require more groundwater banking capacity to capture such water that previously remained in foothill reservoirs (Lakes Millerton and Kaweah). This Project adds recharge/regulation basin capacity for the Kaweah Delta WCD and City of Farmersville and should thus aid in mitigating for adverse impacts due to climate variability.

Beneficial Use of Floodwater. This Project will construct a new basin that will allow the District to deliver surplus and floodwater from the Kaweah and St. Johns Rivers and the Friant Division CVP for a beneficial use and thereby reduce the hazardous floodwater that eventually reaches the Tulare Lake Bottom which is currently farmed. Also, this project will increase the flood control protection for the disadvantaged City of Farmersville.

Preservation of Groundwater Resources. Groundwater resources in Kaweah Delta WCD and the surrounding area will be preserved through additional surface water being delivered through the Project thus offsetting groundwater pumping and increasing groundwater recharge.

14.4 Oakes Basin Habitat Enhancement Project

This project is not anticipated to have any water supply benefits associated with it.

14.5 GW Quality Protection and Investigation

The main benefits of this project are justified as water quality benefits in Attachment 8. Protecting this quality of this water will, however, prevent the disadvantage communities from seeking other water supplies.

**ATTACHMENT 7 – ECONOMIC ANALYSIS – WATER SUPPLY
COSTS AND BENEFITS**

APPENDIX A

Table 11 – Plum Basin Project

Table 11- Annual Cost of Project (All costs should be in 2009 Dollars) Project: <u>Plum Basin Project</u>									
	Initial Costs	Operations and Maintenance Costs ⁽¹⁾						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
YEAR	Grand Total Cost From Table 7 (row (i), column(d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a) +...+ (f)	Discount Factor	Discounted Costs(g) x (h)
2009	\$54,249		\$0	\$0			\$54,249	1.000	\$54,249
2010	\$758,915		\$0	\$0			\$758,915	0.943	\$715,958
2011	\$1,475,849	\$8,500	\$1,500	\$11,000		\$500	\$1,497,349	0.890	\$1,332,635
2012	\$969,546	\$8,500	\$1,500	\$11,000		\$500	\$991,046	0.840	\$832,101
2013		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.792	\$17,030
2014		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.747	\$16,066
2015		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.705	\$15,157
2016		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.665	\$14,299
2017		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.627	\$13,489
2018		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.592	\$12,726
2019		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.558	\$12,005
2020		\$8,500	\$1,500	\$11,000	\$150,000	\$500	\$171,500	0.527	\$90,344
2021		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.497	\$10,685
2022		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.469	\$10,080
2023		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.442	\$9,509
2024		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.417	\$8,971
2025		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.394	\$8,463
2026		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.371	\$7,984
2027		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.350	\$7,532
2028		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.331	\$7,106
2029		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.312	\$6,704
2030		\$8,500	\$1,500	\$11,000	\$150,000	\$500	\$171,500	0.294	\$50,448
2031		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.278	\$5,966
2032		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.262	\$5,629
2033		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.247	\$5,310
2034		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.233	\$5,009
2035		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.220	\$4,726
2036		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.207	\$4,458
2037		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.196	\$4,206
2038		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.185	\$3,968
2039		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.174	\$3,743
2040		\$8,500	\$1,500	\$11,000	\$150,000	\$500	\$171,500	0.164	\$28,170
2041		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.155	\$3,332
2042		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.146	\$3,143
2043		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.138	\$2,965
2044		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.130	\$2,797
2045		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.123	\$2,639
2046		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.116	\$2,490
2047		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.109	\$2,349
2048		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.103	\$2,216
2049		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.097	\$2,090
2050		\$8,500	\$1,500	\$11,000	\$150,000	\$500	\$171,500	0.092	\$15,730
2051		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.087	\$1,860
2052		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.082	\$1,755
2053		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.077	\$1,656
2054		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.073	\$1,562
2055		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.069	\$1,474
2056		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.065	\$1,390
2057		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.061	\$1,311
2058		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.058	\$1,237
2059		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.054	\$1,167
2060		\$8,500	\$1,500	\$11,000	\$150,000	\$500	\$171,500	0.051	\$8,783
2061		\$8,500	\$1,500	\$11,000		\$500	\$21,500	0.048	\$1,039
Total Present Value of Discounted Costs (Sum of Column (i)) Transfer to Table 20, column (c), Exhibit F: Proposal Costs and Benefits Summaries									\$3,387,713
Comments:									

(1) The incremental change in O&M costs attributable to the project.

**ATTACHMENT 7 – ECONOMIC ANALYSIS – WATER SUPPLY
COSTS AND BENEFITS**

APPENDIX B

Table 12 – Plum Basin Project

Table 12 - Annual Water Supply Benefits

(All benefits should be in 2009 dollars)

Project: Plum Basin Project

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit \$ Value (1)	(h) Annual \$ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
2009								1.000	
2010								0.943	
2011	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.890	\$66,216
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.890	\$148,985
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.890	\$6,675
2012	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.840	\$62,468
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.840	\$140,552
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.840	\$6,297
2013	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.792	\$58,932
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.792	\$132,596
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.792	\$5,941
2014	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.747	\$55,596
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.747	\$125,091
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.747	\$5,604
2015	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.705	\$52,449
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.705	\$118,010
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.705	\$5,287
2016	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.665	\$49,480
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.665	\$111,331
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.665	\$4,988
2017	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.627	\$46,679
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.627	\$105,029
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.627	\$4,706
2018	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.592	\$44,037
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.592	\$99,084
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.592	\$4,439
2019	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.558	\$41,545
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.558	\$93,475
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.558	\$4,188
2020	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.527	\$39,193
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.527	\$88,184
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.527	\$3,951
2021	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.497	\$36,975
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.497	\$83,193
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.497	\$3,727
2022	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.469	\$34,882
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.469	\$78,484
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.469	\$3,516
2023	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.442	\$32,907
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.442	\$74,041
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.442	\$3,317
2024	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.417	\$31,045
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.417	\$69,850

Table 12 - Annual Water Supply Benefits

(All benefits should be in 2009 dollars)

Project: Plum Basin Project

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit \$ Value (1)	(h) Annual \$ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.417	\$3,129
2025	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.394	\$29,287
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.394	\$65,896
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.394	\$2,952
2026	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.371	\$27,630
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.371	\$62,166
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.371	\$2,785
2027	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.350	\$26,066
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.350	\$58,648
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.350	\$2,628
2028	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.331	\$24,590
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.331	\$55,328
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.331	\$2,479
2029	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.312	\$23,198
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.312	\$52,196
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.312	\$2,339
2030	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.294	\$21,885
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.294	\$49,242
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.294	\$2,206
2031	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.278	\$20,646
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.278	\$46,454
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.278	\$2,081
2032	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.262	\$19,478
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.262	\$43,825
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.262	\$1,963
2033	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.247	\$18,375
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.247	\$41,344
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.247	\$1,852
2034	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.233	\$17,335
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.233	\$39,004
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.233	\$1,747
2035	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.220	\$16,354
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.220	\$36,796
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.220	\$1,649
2036	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.207	\$15,428
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.207	\$34,713
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.207	\$1,555
2037	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.196	\$14,555
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.196	\$32,748
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.196	\$1,467
2038	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.185	\$13,731
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.185	\$30,895

Table 12 - Annual Water Supply Benefits

(All benefits should be in 2009 dollars)

Project: Plum Basin Project

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit \$ Value (1)	(h) Annual \$ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.185	\$1,384
2039	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.174	\$12,954
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.174	\$29,146
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.174	\$1,306
2040	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.164	\$12,221
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.164	\$27,496
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.164	\$1,232
2041	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.155	\$11,529
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.155	\$25,940
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.155	\$1,162
2042	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.146	\$10,876
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.146	\$24,472
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.146	\$1,096
2043	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.138	\$10,261
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.138	\$23,086
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.138	\$1,034
2044	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.130	\$9,680
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.130	\$21,780
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.130	\$976
2045	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.123	\$9,132
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.123	\$20,547
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.123	\$921
2046	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.116	\$8,615
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.116	\$19,384
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.116	\$868
2047	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.109	\$8,127
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.109	\$18,287
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.109	\$819
2048	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.103	\$7,667
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.103	\$17,251
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.103	\$773
2049	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.097	\$7,233
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.097	\$16,275
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.097	\$729
2050	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.092	\$6,824
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.092	\$15,354
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.092	\$688
2051	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.087	\$6,438
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.087	\$14,485
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.087	\$649
2052	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.082	\$6,073
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.082	\$13,665

Table 12 - Annual Water Supply Benefits

(All benefits should be in 2009 dollars)

Project: Plum Basin Project

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit \$ Value (1)	(h) Annual \$ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.082	\$612
2053	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.077	\$5,729
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.077	\$12,891
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.077	\$578
2054	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.073	\$5,405
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.073	\$12,162
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.073	\$545
2055	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.069	\$5,099
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.069	\$11,473
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.069	\$514
2056	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.065	\$4,811
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.065	\$10,824
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.065	\$485
2057	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.061	\$4,538
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.061	\$10,211
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.061	\$457
2058	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.058	\$4,281
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.058	\$9,633
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.058	\$432
2059	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.054	\$4,039
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.054	\$9,088
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.054	\$407
2060	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.051	\$3,810
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.051	\$8,573
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.051	\$384
2061	water sold to City	AF	0	3720	3720	\$20	\$74,400	0.048	\$3,595
	Relieved GW pumping in District	AF	0	5580	5580	\$30	\$167,400	0.048	\$8,088
	Reduction in spill	AF	0	500	500	\$15	\$7,500	0.048	\$362
Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table)									\$3,719,056
Comments:									

⁽¹⁾ Complete these columns if dollar value is being claimed for the benefit.

**ATTACHMENT 7 – ECONOMIC ANALYSIS – WATER SUPPLY
COSTS AND BENEFITS**

APPENDIX C

Table 13 – Plum Basin Project

Table 13 - Annual Costs of Avoided Projects

(All avoided costs should be in 2009 dollars)

Project: Plum Basin Project

	Costs				Discounting Calculations	
(a)	(b)	(c)	(d)	(e)	(f)	(g)
YEAR	Alternative (Avoided Project Name): City of Tulare Well Pump Lowering Program				Discount Factor	Discounted Costs (e) x (f)
	Avoided Project Description: If recharge project not persued, the City would need to lower pump bowl in supply wells.					
	Avoided Capital Costs	Avoided Replacement Costs	Avoided Operations and Maintenance Costs	Total Cost Avoided for Individual Alternatives (b) + (c) + (d)		
2009				0	1.000	\$0
2010		43000		43000	0.943	\$40,566
2011		43000		43000	0.890	\$38,270
2012		43000		43000	0.840	\$36,104
2013		43000		43000	0.792	\$34,060
2014		43000		43000	0.747	\$32,132
2015				0	0.705	\$0
2016				0	0.665	\$0
2017				0	0.627	\$0
2018				0	0.592	\$0
2019				0	0.558	\$0
2020				0	0.527	\$0
2021				0	0.497	\$0
2022				0	0.469	\$0
2023				0	0.442	\$0
2024				0	0.417	\$0
2025				0	0.394	\$0
2026				0	0.371	\$0
2027				0	0.350	\$0
2028				0	0.331	\$0
2029				0	0.312	\$0
2030				0	0.294	\$0
2031				0	0.278	\$0
2032				0	0.262	\$0
2033				0	0.247	\$0
2034				0	0.233	\$0
2035				0	0.220	\$0
2036				0	0.207	\$0
2037				0	0.196	\$0
2038				0	0.185	\$0
2039				0	0.174	\$0
2040				0	0.164	\$0
2041				0	0.155	\$0
2042				0	0.146	\$0
2043				0	0.138	\$0
2044				0	0.130	\$0
2045				0	0.123	\$0
2046				0	0.116	\$0
2047				0	0.109	\$0
2048				0	0.103	\$0
2049				0	0.097	\$0

Project: Plum Basin Project

Comments:

**ATTACHMENT 7 – ECONOMIC ANALYSIS – WATER SUPPLY
COSTS AND BENEFITS**

APPENDIX D

Table 15 – Plum Basin Project

Table 15. Total Water Supply Benefits**(All benefits should be in 2009 dollars)****Project: Plum Basin Project**

Total Discounted Water Supply Benefits (a)	Total Discounted Avoided Project Costs (b)	Other Discounted Water Supply Benefits (c)	Total Present Value of Discounted Benefits (d) (a) + (c) or (b) + (c)
\$ 3,719,056.00	\$ 181,132.00	0	\$ 3,900,188

Comments:

**ATTACHMENT 7 – ECONOMIC ANALYSIS – WATER SUPPLY
COSTS AND BENEFITS**

APPENDIX E

Table 11 – Water Reuse Pipeline Project

Table 11- Annual Cost of Project (All costs should be in 2009 Dollars) Project: <u>Water Reuse Pipeline Project</u>									
	Initial Costs	Operations and Maintenance Costs ⁽¹⁾						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
YEAR	Grand Total Cost From Table 7 (row (i), column(d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a) +...+ (f)	Discount Factor	Discounted Costs(g) x (h)
2009	\$142,375						\$142,375	1.000	\$142,375
2010	\$552,533						\$552,533	0.943	\$521,258
2011	\$3,115,587	\$25,000	\$20,905	\$50,000			\$3,211,492	0.890	\$2,858,216
2012	\$10,406,100	\$25,000	\$21,586	\$50,000			\$10,502,686	0.840	\$8,818,258
2013		\$25,000	\$22,276	\$50,000			\$97,276	0.792	\$77,052
2014		\$25,000	\$22,975	\$50,000			\$97,975	0.747	\$73,213
2015		\$25,000	\$23,684	\$50,000			\$98,684	0.705	\$69,568
2016		\$25,000	\$24,403	\$50,000			\$99,403	0.665	\$66,109
2017		\$25,000	\$25,132	\$50,000			\$100,132	0.627	\$62,824
2018		\$25,000	\$25,870	\$50,000			\$100,870	0.592	\$59,705
2019		\$25,000	\$26,620	\$50,000			\$101,620	0.558	\$56,744
2020		\$25,000	\$27,379	\$50,000	\$1,000,000		\$1,102,379	0.527	\$580,720
2021		\$25,000	\$28,150	\$50,000			\$103,150	0.497	\$51,262
2022		\$25,000	\$28,931	\$50,000			\$103,931	0.469	\$48,727
2023		\$25,000	\$29,724	\$50,000			\$104,724	0.442	\$46,320
2024		\$25,000	\$30,529	\$50,000			\$105,529	0.417	\$44,034
2025		\$25,000	\$31,344	\$50,000			\$106,344	0.394	\$41,862
2026		\$25,000	\$32,172	\$50,000			\$107,172	0.371	\$39,800
2027		\$25,000	\$33,012	\$50,000			\$108,012	0.350	\$37,841
2028		\$25,000	\$33,864	\$50,000			\$108,864	0.331	\$35,981
2029		\$25,000	\$34,728	\$50,000			\$109,728	0.312	\$34,214
2030		\$25,000	\$35,605	\$50,000	\$1,000,000		\$1,110,605	0.294	\$326,690
2031		\$25,000	\$36,495	\$50,000			\$111,495	0.278	\$30,940
2032		\$25,000	\$36,495	\$50,000			\$111,495	0.262	\$29,189
2033		\$25,000	\$36,495	\$50,000			\$111,495	0.247	\$27,537
2034		\$25,000	\$36,495	\$50,000			\$111,495	0.233	\$25,978
2035		\$25,000	\$36,495	\$50,000			\$111,495	0.220	\$24,508
2036		\$25,000	\$36,495	\$50,000			\$111,495	0.207	\$23,120
2037		\$25,000	\$36,495	\$50,000			\$111,495	0.196	\$21,812
2038		\$25,000	\$36,495	\$50,000			\$111,495	0.185	\$20,577
2039		\$25,000	\$36,495	\$50,000			\$111,495	0.174	\$19,412
2040		\$25,000	\$36,495	\$50,000	\$1,000,000		\$1,111,495	0.164	\$182,568
2041		\$25,000	\$36,495	\$50,000			\$111,495	0.155	\$17,277
2042		\$25,000	\$36,495	\$50,000			\$111,495	0.146	\$16,299
2043		\$25,000	\$36,495	\$50,000			\$111,495	0.138	\$15,376
2044		\$25,000	\$36,495	\$50,000			\$111,495	0.130	\$14,506
2045		\$25,000	\$36,495	\$50,000			\$111,495	0.123	\$13,685
2046		\$25,000	\$36,495	\$50,000			\$111,495	0.116	\$12,910
2047		\$25,000	\$36,495	\$50,000			\$111,495	0.109	\$12,180
2048		\$25,000	\$36,495	\$50,000			\$111,495	0.103	\$11,490
2049		\$25,000	\$36,495	\$50,000			\$111,495	0.097	\$10,840
2050		\$25,000	\$36,495	\$50,000	\$1,000,000		\$1,111,495	0.092	\$101,945
2051		\$25,000	\$36,495	\$50,000			\$111,495	0.087	\$9,647
Total Present Value of Discounted Costs (Sum of Column (i))									\$14,734,570
Transfer to Table 20, column (c), Exhibit F: Proposal Costs and Benefits Summaries									
Comments:									

(1) The incremental change in O&M costs attributable to the project.

**ATTACHMENT 7 – ECONOMIC ANALYSIS – WATER SUPPLY
COSTS AND BENEFITS**

APPENDIX F

Table 12 – Water Reuse Pipeline Project

Table 12 - Annual Water Supply Benefits

(All benefits should be in 2009 dollars)

Project: Water Reuse Pipeline Project

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Year	Type of Benefit	Measure of Benefit (Units)	Without Project	With Project	Change Resulting from Project (e) – (d)	Unit \$ Value (1)	Annual \$ Value (f) x (g) (1)	Discount Factor (1)	Discounted Benefits (h) x (i) (1)
2009								1.000	
2010								0.943	
2011	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.890	\$381,808
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.890	\$774,297
2012	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.840	\$360,197
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.840	\$730,469
2013	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.792	\$339,808
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.792	\$689,121
2014	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.747	\$320,574
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.747	\$650,115
2015	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.705	\$302,428
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.705	\$613,316
2016	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.665	\$285,310
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.665	\$578,600
2017	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.627	\$269,160
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.627	\$545,849
2018	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.592	\$253,924
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.592	\$514,952
2019	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.558	\$239,551
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.558	\$485,803
2020	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.527	\$225,992
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.527	\$458,305
2021	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.497	\$213,200
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.497	\$432,363
2022	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.469	\$201,132
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.469	\$407,890
2023	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.442	\$189,747
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.442	\$384,802
2024	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.417	\$179,007
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.417	\$363,021
2025	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.394	\$168,874
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.394	\$342,472
2026	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.371	\$159,315
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.371	\$323,087
2027	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.350	\$150,297
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.350	\$304,799
2028	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.331	\$141,790
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.331	\$287,546
2029	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.312	\$133,764
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.312	\$271,270

Table 12 - Annual Water Supply Benefits

(All benefits should be in 2009 dollars)

Project: Water Reuse Pipeline Project

(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Year	Type of Benefit	Measure of Benefit (Units)	Without Project	With Project	Change Resulting from Project (e) - (d)	Unit \$ Value (1)	Annual \$ Value (f) x (g) (1)	Discount Factor (1)	Discounted Benefits (h) x (i) (1)
2030	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.294	\$126,193
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.294	\$255,915
2031	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.278	\$119,050
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.278	\$241,429
2032	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.262	\$112,311
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.262	\$227,764
2033	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.247	\$105,954
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.247	\$214,871
2034	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.233	\$99,956
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.233	\$202,709
2035	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.220	\$94,299
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.220	\$191,235
2036	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.207	\$88,961
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.207	\$180,410
2037	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.196	\$83,925
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.196	\$170,198
2038	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.185	\$79,175
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.185	\$160,564
2039	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.174	\$74,693
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.174	\$151,476
2040	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.164	\$70,465
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.164	\$142,902
2041	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.155	\$66,477
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.155	\$134,813
2042	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.146	\$62,714
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.146	\$127,182
2043	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.138	\$59,164
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.138	\$119,983
2044	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.130	\$55,815
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.130	\$113,192
2045	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.123	\$52,656
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.123	\$106,784
2046	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.116	\$49,675
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.116	\$100,740
2047	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.109	\$46,863
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.109	\$95,038
2048	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.103	\$44,211
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.103	\$89,658
2049	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.097	\$41,708

Table 12 - Annual Water Supply Benefits (All benefits should be in 2009 dollars) Project: <u>Water Reuse Pipeline Project</u>									
(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit \$ Value (1)	(h) Annual \$ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.097	\$84,583
2050	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.092	\$39,347
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.092	\$79,796
2051	Value of new Water Supply to TID	AF	0	13000	13000	\$33	\$429,000	0.087	\$37,120
	Relieved GW pumping	AF	0	29000	29000	\$30	\$870,000	0.087	\$75,279
Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table)									\$18,551,210
Comments:									

⁽¹⁾ Complete these columns if dollar value is being claimed for the benefit.

**ATTACHMENT 7 – ECONOMIC ANALYSIS – WATER SUPPLY
COSTS AND BENEFITS**

APPENDIX G

Table 13 – Water Reuse Pipeline Project

Table 13 - Annual Costs of Avoided Projects

(All avoided costs should be in 2009 dollars)

Project: Water Reuse Pipeline Project

	Costs				Discounting Calculations	
(a)	(b)	(c)	(d)	(e)	(f)	(g)
YEAR	Alternative (Avoided Project Name): <u>NPDES Permit and Import Surface Water Purchase</u>				Discount Factor	Discounted Costs (e) x (f)
	Avoided Project Description: <i>Tertiary treatment avoids NPDES permit costs of \$100,000/yr. Exchange agreement avoids the City purchasing wet year surplus water supplies (1 in 3 years).</i>					
	Avoided Capital Costs	Avoided Replacement Costs	Avoided Operations and Maintenance Costs	Total Cost Avoided for Individual Alternatives		
	(b) + (c) + (d)					
2009				\$ -	1.000	\$0
2010				\$ -	0.943	\$0
2011	\$ 100,000.00			\$ 100,000.00	0.890	\$89,000
2012	\$ 100,000.00			\$ 100,000.00	0.840	\$83,962
2013	\$ 782,500.00			\$ 782,500.00	0.792	\$619,813
2014	\$ 100,000.00			\$ 100,000.00	0.747	\$74,726
2015	\$ 100,000.00			\$ 100,000.00	0.705	\$70,496
2016	\$ 782,500.00			\$ 782,500.00	0.665	\$520,407
2017	\$ 100,000.00			\$ 100,000.00	0.627	\$62,741
2018	\$ 100,000.00			\$ 100,000.00	0.592	\$59,190
2019	\$ 782,500.00			\$ 782,500.00	0.558	\$436,944
2020	\$ 100,000.00			\$ 100,000.00	0.527	\$52,679
2021	\$ 100,000.00			\$ 100,000.00	0.497	\$49,697
2022	\$ 782,500.00			\$ 782,500.00	0.469	\$366,867
2023	\$ 100,000.00			\$ 100,000.00	0.442	\$44,230
2024	\$ 100,000.00			\$ 100,000.00	0.417	\$41,727
2025	\$ 782,500.00			\$ 782,500.00	0.394	\$308,028
2026	\$ 100,000.00			\$ 100,000.00	0.371	\$37,136
2027	\$ 100,000.00			\$ 100,000.00	0.350	\$35,034
2028	\$ 782,500.00			\$ 782,500.00	0.331	\$258,626
2029	\$ 100,000.00			\$ 100,000.00	0.312	\$31,180
2030	\$ 100,000.00			\$ 100,000.00	0.294	\$29,416
2031	\$ 782,500.00			\$ 782,500.00	0.278	\$217,148
2032	\$ 100,000.00			\$ 100,000.00	0.262	\$26,180
2033	\$ 100,000.00			\$ 100,000.00	0.247	\$24,698
2034	\$ 782,500.00			\$ 782,500.00	0.233	\$182,321
2035	\$ 100,000.00			\$ 100,000.00	0.220	\$21,981
2036	\$ 100,000.00			\$ 100,000.00	0.207	\$20,737
2037	\$ 782,500.00			\$ 782,500.00	0.196	\$153,081
2038	\$ 100,000.00			\$ 100,000.00	0.185	\$18,456
2039	\$ 100,000.00			\$ 100,000.00	0.174	\$17,411

Project: Water Reuse Pipeline Project

Comments:

**ATTACHMENT 7 – ECONOMIC ANALYSIS – WATER SUPPLY
COSTS AND BENEFITS**

APPENDIX H

Table 15 – Water Reuse Pipeline Project

Table 15. Total Water Supply Benefits**(All benefits should be in 2009 dollars)****Project: Water Reuse Pipeline Project**

Total Discounted Water Supply Benefits (a)	Total Discounted Avoided Project Costs (b)	Other Discounted Water Supply Benefits (c)	Total Present Value of Discounted Benefits (d) (a) + (c) or (b) + (c)
\$ 18,551,210	\$ 4,451,494	0	\$ 23,002,704

Comments:

**ATTACHMENT 7 – ECONOMIC ANALYSIS – WATER SUPPLY
COSTS AND BENEFITS**

APPENDIX I

Table 11 – Paregien Basin Project

Table 11- Annual Cost of Project (All costs should be in 2009 Dollars) Project: Paregien Basin									
	Initial Costs	Operations and Maintenance Costs ⁽¹⁾						Discounting Calculations	
YEAR	(a) Grand Total Cost From Table 7 (row (i), column(d))	(b) Admin	(c) Operation	(d) Maintenance	(e) Replacement	(f) Other (Monitoring)	(g) Total Costs (a) + ... + (f)	(h) Discount Factor	(i) Discounted Costs(g) x (h)
2009							\$0	1.000	\$0
2010							\$0	0.943	\$0
2011	\$150,342						\$150,342	0.890	\$133,804
2012	\$198,094	\$3,185	\$4,300	\$10,000	\$0	\$500	\$216,079	0.840	\$181,506
2013	\$1,349,604	\$3,185	\$4,300	\$10,000	\$0	\$500	\$1,367,589	0.791	\$1,081,996
2014		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.746	\$13,420
2015		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.704	\$12,657
2016		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.664	\$11,937
2017		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.626	\$11,258
2018		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.590	\$10,617
2019		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.557	\$10,014
2020		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.525	\$9,444
2021		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.495	\$8,907
2022		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.467	\$8,400
2023		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.440	\$7,922
2024		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.415	\$7,472
2025		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.392	\$7,047
2026		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.370	\$6,646
2027		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.349	\$6,268
2028		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.329	\$5,911
2029		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.310	\$5,575
2030		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.292	\$5,258
2031		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.276	\$4,959
2032		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.260	\$4,677
2033		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.245	\$4,411
2034		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.231	\$4,160
2035		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.218	\$3,923
2036		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.206	\$3,700
2037		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.194	\$3,490
2038		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.183	\$3,291
2039		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.173	\$3,104
2040		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.163	\$2,928
2041		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.154	\$2,761
2042		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.145	\$2,604
2043		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.137	\$2,456
2044		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.129	\$2,316
2045		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.121	\$2,184
2046		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.115	\$2,060
2047		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.108	\$1,943
2048		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.102	\$1,833
2049		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.096	\$1,728
2050		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.091	\$1,630
2051		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.085	\$1,537
2052		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.081	\$1,450
2053		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.076	\$1,367
2054		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.072	\$1,290
2055		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.068	\$1,216
2056		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.064	\$1,147
2057		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.060	\$1,082
2058		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.057	\$1,020
2059		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.054	\$962
2060		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.050	\$908
2061		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.048	\$856
2062		\$3,185	\$4,300	\$10,000	\$0	\$500	\$17,985	0.045	\$807
Project Life									
Total Present Value of Discounted Costs (Sum of Column (i)) Transfer to Table 20, column (c), Exhibit F: Proposal Costs and Benefits Summaries									\$1,619,861
Comments:									

(1) The incremental change in O&M costs attributable to the project.

**ATTACHMENT 7 – ECONOMIC ANALYSIS – WATER SUPPLY
COSTS AND BENEFITS**

APPENDIX J

Table 12 – Paregien Basin Project

Table 12 - Annual Water Supply Benefits

(All benefits should be in 2009 dollars)

Project: Paregien Basin

(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit \$ Value (1)	(h) Annual \$ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
2009					0		\$0	1.000	\$0
2010					0		\$0	0.943	\$0
2011					0		\$0	0.890	\$0
2012					0		\$0	0.840	\$0
2013	New Supply	AF	0	2370	2370	\$30	\$71,100	0.791	\$56,252
2014	New Supply	AF	0	2370	2370	\$30	\$71,100	0.746	\$53,053
2015	New Supply	AF	0	2370	2370	\$30	\$71,100	0.704	\$50,035
2016	New Supply	AF	0	2370	2370	\$30	\$71,100	0.664	\$47,189
2017	New Supply	AF	0	2370	2370	\$30	\$71,100	0.626	\$44,505
2018	New Supply	AF	0	2370	2370	\$30	\$71,100	0.590	\$41,974
2019	New Supply	AF	0	2370	2370	\$30	\$71,100	0.557	\$39,586
2020	New Supply	AF	0	2370	2370	\$30	\$71,100	0.525	\$37,335
2021	New Supply	AF	0	2370	2370	\$30	\$71,100	0.495	\$35,211
2022	New Supply	AF	0	2370	2370	\$30	\$71,100	0.467	\$33,208
2023	New Supply	AF	0	2370	2370	\$30	\$71,100	0.440	\$31,320
2024	New Supply	AF	0	2370	2370	\$30	\$71,100	0.415	\$29,538
2025	New Supply	AF	0	2370	2370	\$30	\$71,100	0.392	\$27,858
2026	New Supply	AF	0	2370	2370	\$30	\$71,100	0.370	\$26,274
2027	New Supply	AF	0	2370	2370	\$30	\$71,100	0.349	\$24,779
2028	New Supply	AF	0	2370	2370	\$30	\$71,100	0.329	\$23,370
2029	New Supply	AF	0	2370	2370	\$30	\$71,100	0.310	\$22,040
2030	New Supply	AF	0	2370	2370	\$30	\$71,100	0.292	\$20,787
2031	New Supply	AF	0	2370	2370	\$30	\$71,100	0.276	\$19,604
2032	New Supply	AF	0	2370	2370	\$30	\$71,100	0.260	\$18,489
2033	New Supply	AF	0	2370	2370	\$30	\$71,100	0.245	\$17,438
2034	New Supply	AF	0	2370	2370	\$30	\$71,100	0.231	\$16,446
2035	New Supply	AF	0	2370	2370	\$30	\$71,100	0.218	\$15,511
2036	New Supply	AF	0	2370	2370	\$30	\$71,100	0.206	\$14,628
2037	New Supply	AF	0	2370	2370	\$30	\$71,100	0.194	\$13,796
2038	New Supply	AF	0	2370	2370	\$30	\$71,100	0.183	\$13,012
2039	New Supply	AF	0	2370	2370	\$30	\$71,100	0.173	\$12,271
2040	New Supply	AF	0	2370	2370	\$30	\$71,100	0.163	\$11,573
2041	New Supply	AF	0	2370	2370	\$30	\$71,100	0.154	\$10,915
2042	New Supply	AF	0	2370	2370	\$30	\$71,100	0.145	\$10,294
2043	New Supply	AF	0	2370	2370	\$30	\$71,100	0.137	\$9,709
2044	New Supply	AF	0	2370	2370	\$30	\$71,100	0.129	\$9,157
2045	New Supply	AF	0	2370	2370	\$30	\$71,100	0.121	\$8,636
2046	New Supply	AF	0	2370	2370	\$30	\$71,100	0.115	\$8,145
2047	New Supply	AF	0	2370	2370	\$30	\$71,100	0.108	\$7,681
2048	New Supply	AF	0	2370	2370	\$30	\$71,100	0.102	\$7,244
2049	New Supply	AF	0	2370	2370	\$30	\$71,100	0.096	\$6,832
2050	New Supply	AF	0	2370	2370	\$30	\$71,100	0.091	\$6,444
2051	New Supply	AF	0	2370	2370	\$30	\$71,100	0.085	\$6,077
2052	New Supply	AF	0	2370	2370	\$30	\$71,100	0.081	\$5,732
2053	New Supply	AF	0	2370	2370	\$30	\$71,100	0.076	\$5,406
2054	New Supply	AF	0	2370	2370	\$30	\$71,100	0.072	\$5,098
2055	New Supply	AF	0	2370	2370	\$30	\$71,100	0.068	\$4,808
2056	New Supply	AF	0	2370	2370	\$30	\$71,100	0.064	\$4,535
2057	New Supply	AF	0	2370	2370	\$30	\$71,100	0.060	\$4,277
2058	New Supply	AF	0	2370	2370	\$30	\$71,100	0.057	\$4,033
2059	New Supply	AF	0	2370	2370	\$30	\$71,100	0.054	\$3,804
2060	New Supply	AF	0	2370	2370	\$30	\$71,100	0.050	\$3,588
2061	New Supply	AF	0	2370	2370	\$30	\$71,100	0.048	\$3,384
2062	New Supply	AF	0	2370	2370	\$30	\$71,100	0.045	\$3,191
Project Life								...	
Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table)									\$936,072
Comments:									

⁽¹⁾ Complete these columns if dollar value is being claimed for the benefit.

**ATTACHMENT 7 – ECONOMIC ANALYSIS – WATER SUPPLY
COSTS AND BENEFITS**

APPENDIX K

Table 11 – Oakes Basin Habitat Restoration Project

Table 11- Annual Cost of Project (All costs should be in 2009 Dollars) Project: <u>Oakes Basin Habitat Enhancement Project</u>									
	Initial Costs	Operations and Maintenance Costs ⁽¹⁾						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
YEAR	Grand Total Cost From Table 7 (row (i), column(d))	Admin	Operation	Maintenance	Replacement	Other	Total Costs (a) +...+ (f)	Discount Factor	Discounted Costs(g) x (h)
2009	\$0						\$0	1.000	\$0
2010	\$0						\$0	0.943	\$0
2011	\$41,380	\$0	\$0	\$0	\$0	\$0	\$41,380	0.890	\$36,828
2012	\$123,326	\$0	\$0	\$0	\$0	\$0	\$123,326	0.840	\$103,547
Total Present Value of Discounted Costs (Sum of Column (i)) Transfer to Table 20, column (c), Exhibit F: Proposal Costs and Benefits Summaries									\$140,375
Comments: Operation and maintenance costs are included in the Initial cost as it is required to establish the vegetation. There will be no costs associated with administration, operation, maintenance, or replacement, over the life of this project, since this project is designed to restore native vegetation.									

(1) The incremental change in O&M costs attributable to the project.

**ATTACHMENT 7 – ECONOMIC ANALYSIS – WATER SUPPLY
COSTS AND BENEFITS**

APPENDIX L

Table 16 – Oakes Basin Habitat Restoration Project

Table 16 - Water Quality and Other Expected Benefits (All benefits should be in 2009 dollars) Project: <u>Oakes Basin Habitat Enhancement Project</u>									
(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit \$ Value (1)	(h) Annual \$ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
2009					0		\$0	1.000	\$0
2010					0		\$0	0.943	\$0
2011					0		\$0	0.890	\$0
2012	Mitigation	Tree	0	275	275	\$1,200	\$330,000	0.840	\$277,074
Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries									
Comments:									

(1) Complete these columns if dollar value is being claimed for the benefit.

**ATTACHMENT 7 – ECONOMIC ANALYSIS – WATER SUPPLY
COSTS AND BENEFITS**

APPENDIX M

**Table 11 – Groundwater Quality Protection and
Investigation Project**

Table 11- Annual Cost of Project (All costs should be in 2009 Dollars) Project: <u>Groundwater Quality Protection & Investigation Project</u>									
	Initial Costs	Operations and Maintenance Costs ⁽¹⁾						Discounting Calculations	
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)
YEAR	Grand Total Cost From Table 7 (row (i), column(d))	Admin	Operation (Pumping)	Maintenance	Replacement	Other (Monitoring)	Total Costs (a) +...+ (f)	Discount Factor	Discounted Costs(g) x (h)
2009							\$0	1.000	\$0
2010							\$0	0.943	\$0
2011	\$32,390						\$32,390	0.890	\$28,827
2012	\$392,380	\$0	\$0	\$0	\$0	\$0	\$392,380	0.840	\$329,599
2013	\$136,580	\$0	\$0	\$0	\$0	\$0	\$136,580	0.791	\$108,058
Total Present Value of Discounted Costs (Sum of Column (i)) Transfer to Table 20, column (c), Exhibit F: Proposal Costs and Benefits Summaries									\$466,484
Comments:									

(1) The incremental change in O&M costs attributable to the project.

**ATTACHMENT 7 – ECONOMIC ANALYSIS – WATER SUPPLY
COSTS AND BENEFITS**

APPENDIX N

**Table 16 – Groundwater Quality Protection and
Investigation Project**

Table 16 - Water Quality and Other Expected Benefits (All benefits should be in 2009 dollars) Project: <u>Groundwater Quality Protection and Investigation Project</u>									
(a) Year	(b) Type of Benefit	(c) Measure of Benefit (Units)	(d) Without Project	(e) With Project	(f) Change Resulting from Project (e) – (d)	(g) Unit \$ Value (1)	(h) Annual \$ Value (f) x (g) (1)	(i) Discount Factor (1)	(j) Discounted Benefits (h) x (i) (1)
2009	Avoided Cost	--	--	--	--	--	\$0	1.000	\$0
2010	Avoided Cost	--	--	--	--	--	\$0	0.943	\$0
2011	Avoided Cost	--	--	--	--	--	\$0	0.890	\$0
2012	Avoided Cost	--	--	--	--	--	\$510,700	0.840	\$428,988
2013	Avoided Cost	--	--	--	--	--	\$10,700	0.791	\$8,466
2014	Avoided Cost	--	--	--	--	--	\$10,700	0.746	\$7,984
2015	Avoided Cost	--	--	--	--	--	\$10,700	0.704	\$7,530
2016	Avoided Cost	--	--	--	--	--	\$10,700	0.664	\$7,102
2017	Avoided Cost	--	--	--	--	--	\$39,290	0.626	\$24,594
2018	Avoided Cost	--	--	--	--	--	\$18,540	0.590	\$10,945
2019	Avoided Cost	--	--	--	--	--	\$18,540	0.557	\$10,323
2020	Avoided Cost	--	--	--	--	--	\$18,540	0.525	\$9,735
2021	Avoided Cost	--	--	--	--	--	\$18,540	0.495	\$9,182
2022	Avoided Cost	--	--	--	--	--	\$18,540	0.467	\$8,659
2023	Avoided Cost	--	--	--	--	--	\$18,540	0.440	\$8,167
2024	Avoided Cost	--	--	--	--	--	\$18,540	0.415	\$7,702
2025	Avoided Cost	--	--	--	--	--	\$18,540	0.392	\$7,264
2026	Avoided Cost	--	--	--	--	--	\$18,540	0.370	\$6,851
2027	Avoided Cost	--	--	--	--	--	\$18,540	0.349	\$6,461
2028	Avoided Cost	--	--	--	--	--	\$18,540	0.329	\$6,094
2029	Avoided Cost	--	--	--	--	--	\$18,540	0.310	\$5,747
2030	Avoided Cost	--	--	--	--	--	\$18,540	0.292	\$5,420
2031	Avoided Cost	--	--	--	--	--	\$18,540	0.276	\$5,112
2032	Avoided Cost	--	--	--	--	--	\$18,540	0.260	\$4,821
2033	Avoided Cost	--	--	--	--	--	\$18,540	0.245	\$4,547
2034	Avoided Cost	--	--	--	--	--	\$18,540	0.231	\$4,288
2035	Avoided Cost	--	--	--	--	--	\$18,540	0.218	\$4,045
2036	Avoided Cost	--	--	--	--	--	\$18,540	0.206	\$3,814
2037	Avoided Cost	--	--	--	--	--	\$3,000	0.194	\$582
2038	Avoided Cost	--	--	--	--	--	\$3,000	0.183	\$549
2039	Avoided Cost	--	--	--	--	--	\$3,000	0.173	\$518
2040	Avoided Cost	--	--	--	--	--	\$3,000	0.163	\$488
2041	Avoided Cost	--	--	--	--	--	\$3,000	0.154	\$461
2042	Avoided Cost	--	--	--	--	--	\$3,000	0.145	\$434
2043	Avoided Cost	--	--	--	--	--	\$3,000	0.137	\$410
2044	Avoided Cost	--	--	--	--	--	\$3,000	0.129	\$386
2045	Avoided Cost	--	--	--	--	--	\$3,000	0.121	\$364
2046	Avoided Cost	--	--	--	--	--	\$3,000	0.115	\$344
Project Life								30	
Total Present Value of Discounted Benefits Based on Unit Value (Sum of the values in Column (j) for all Benefits shown in table) Transfer to Table 20, column (f), Exhibit F: Proposal Costs and Benefits Summaries									\$618,378
Comments: - Creation of wetland habitat is assumed to be only a physically quantified benefit.									

(1) Complete these columns if dollar value is being claimed for the benefit.